

INCH-POUND

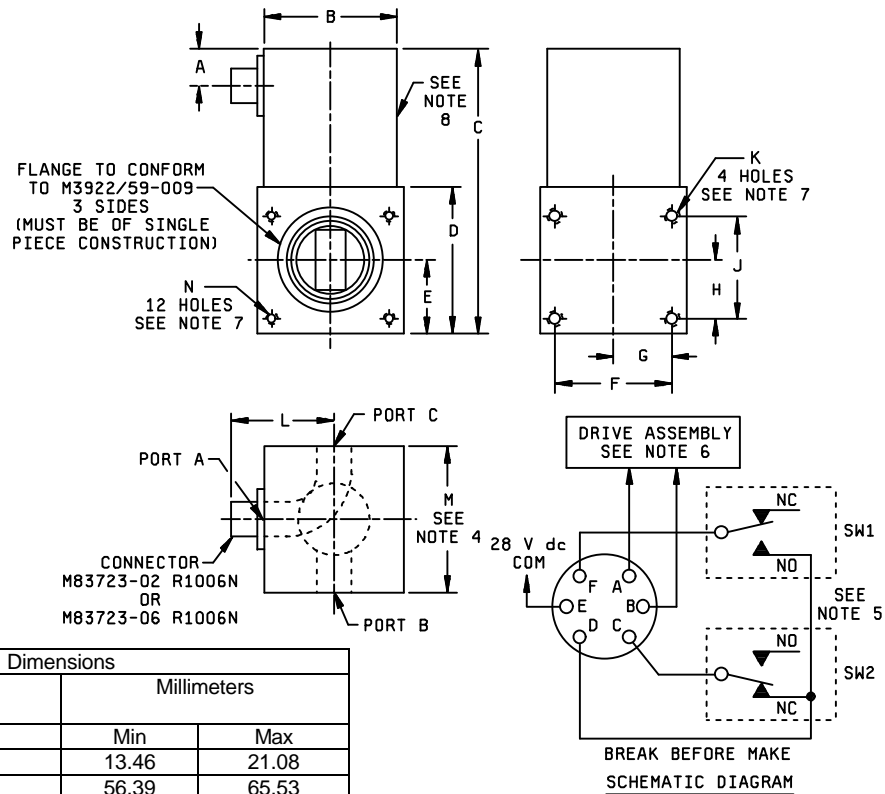
MIL-DTL-55041/10A
2 February 2000
SUPERSEDING
MIL-S-55041/10(USAF)
4 April 1977

DETAIL SPECIFICATION SHEET

SWITCH, WAVEGUIDE, ELECTROMECHANICAL, LATCHING,
FREQUENCY RANGE 8.6 TO 10.3 GHz

This specification sheet is approved for use by all
Departments and Agencies of the Department of Defense.

The requirements for acquiring the switch described herein shall
consist of this document and the latest issue of MIL-DTL-55041.



Lt r	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.53	.83	13.46	21.08
B	2.22 square	2.58 square	56.39 square	65.53 square
C	4.50	5.50	114.30	139.70
D	2.43	2.60	61.72	66.04
E	---	1.250	---	31.75
F	---	2.000	---	50.80
G	---	1.000	---	25.40
H	---	1.000	---	25.40
J	---	1.750	---	44.45
K	.190-32 UNF-2B Hole depth .370 Min		4.83-32 UNF-2B Hole depth 9.40 Min	
L	1.794	1.806	45.57	45.87
M	---	2.62 square	---	66.55 square
N	.164-32 UNC-2B Full thread depth .370 Min		4.17-32 UNC-2B Full thread depth 9.40 Min	

FIGURE 1. Switch configuration and schematic, PIN M55041/10-001.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only and are based upon 1.00 inch - 25.4 mm.
3. Unless otherwise specified, tolerances are ± 0.02 (0.5 mm) for two place decimals and ± 0.005 (0.13 mm) for three place decimals.
4. Rotor sequence: When the circuit A-E is energized, the RF energy path is from port A to C. When circuit B-E is energized, the RF energy path is from port A to B.
5. Interlock switch operation sequence: When circuit A-E is energized, the circuit C-D must open prior to circuit F-D being closed. When circuit B-E is energized, circuit F-D must open prior to circuit C-D being closed. All normally closed contacts and normally open contacts must open and close respectively within or before the first .03 inch (0.8 mm) of rotor travel and within or after the last .03 inch (0.8 mm) of rotor travel. The rotor shall come to a stop in its end position without visible bounce and shall not operate the interlock switch during such an oscillation.
6. Drive assembly operation: The switch shall not require any holding current. The drive assembly shall be automatically deenergized when the rotor is latched. The direction of drive assembly moving the rotor shall be as specified in the pictorial view.

Case 1: After circuit A-E is energized, if the actuation voltage is removed from it and the rotor is stopped at some point after its first .03 inch (0.8 mm) of travel and before its last .03 inch (0.8 mm) of travel, the rotor shall continue to its new position (open energy path from port A to port C) by reapplying voltage to circuit A-E. However, the rotor shall return to its original position (open energy path from port A to port B) if the reapplied voltage is applied to circuit B-E.

Case 2: After circuit B-E is energized, if the actuation voltage is removed from it and the rotor is stopped at some .03 inch (0.8 mm) of travel, the rotor shall continue to its new position (open energy path from port A to port B) by reapplying voltage to circuit B-E. However, the rotor shall return to its original position (open energy path from port A to port C) if the reapplied voltage is applied to circuit A-E.

7. Helical thread inserts may be used.
8. The shape of the can is optional.

FIGURE 1. Switch configuration and schematic. PIN M55041/10-001 - Continued.

REQUIREMENTS:

Dimensions and configuration: See figure 1.

Exterior surface: Black finish in accordance with MIL-F-14072.

Weight: 2.5 pounds (1.13 kg), maximum.

Operation: 1P2T latching, break before make.

Rotor operation: See figure 1, note 4.

Connector: The power connector shall mate with connector MS3116E10-6S.

Drive assembly operation: See figure 1, note 6.

Drive assembly operating voltage: 21 V dc to 29 V dc.

Drive assembly starting current: 4 amperes, maximum, at 27 V dc.

RF power handling capability: Peak 400 kW, average 400 W.

Temperature altitude: The temperature altitude must be as recommended for class 2 equipment as indicated in MIL-HDBK-5400 except the upper limit for continuous operation must be 90°C in lieu of 71°C and the lower limit for non-operating temperature must be -62°C in lieu of -57°C.

Frequency range: 8.6 GHz to 10.3 GHz.

Isolation: 80 dB, minimum.

VSWR: 1.1:1, maximum.

Insertion loss: 0.10 dB, maximum.

Switching time (see figure 2):

1 second, maximum, 21 V dc at 20°C \pm 10°C;

2 seconds, maximum, 21 V dc at -54°C \pm 5°C.

Pressure: With 30 lb_f/in² (gage) applied, the pressure drop shall not exceed 5 lb_f/in² (gage) in 1 hour.

Pressure equilibrium: 1 lb_f/in², tested as follows:

- a. Seal one active (open) waveguide port by means of an O-ring and flat plate and attach a compressed air (15 lb_f/in² (gage)) input to the other active (open) waveguide port.
- b. Adjust flow rate of compressed air to 100 cubic inches per minute.
- c. Measure the pressure differential between the air input port to which the compressed air is attached and the inactive (closed) waveguide port. The pressure differential shall not exceed the value specified.

Interlock switching current:

5 amperes, maximum, at 27 V dc;

2 amperes, maximum, at 24 V dc.

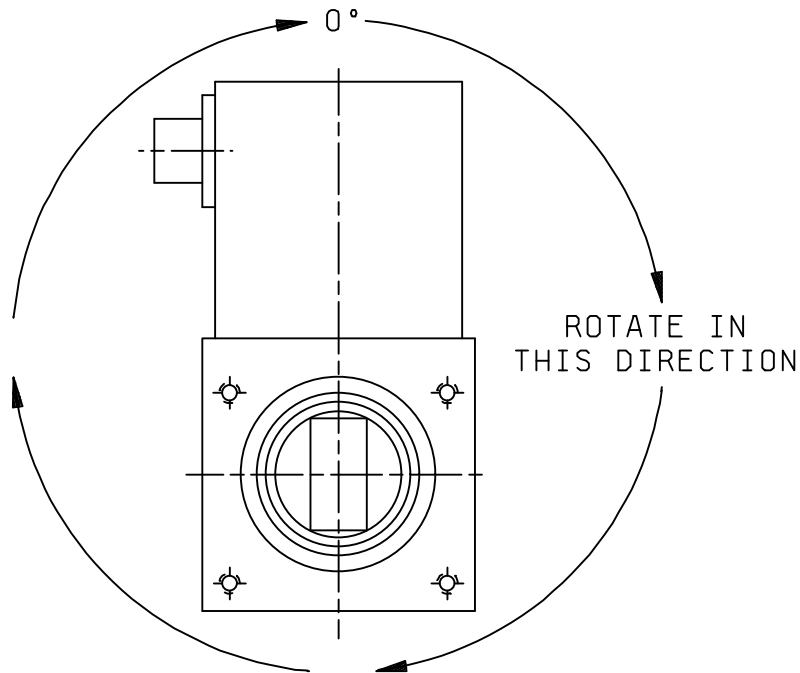
Cycle life: 50,000 cycles; rate of cycling shall be 10 per minute, maximum.

Part or Identifying Number (PIN): M55041/10-001.

Material: Lubricants shall comply, as a minimum, to the requirements of MIL-PRF-83261.

The test set-ups specified in Figures 2, 3, and 4 of MIL-DTL-55041 may be modified to reflect current industry practice.

Explosion: Applicable. The test need not be done with full RF power applied if the switch is designed so that the switching mechanism is completely isolated from the RF energy path.



NOTE: Switching time: The switch shall be mounted in the position shown; the long axis of the switch shall be vertical. The switching time shall be taken and recorded. The switch shall be rotated in 45° increments and switching time recorded at each position through 360°. The switching time shall not vary more than 10 percent from the time recorded at 0° (the original position).

FIGURE 2. Switching time.

NOTE: The switch covered by this specification sheet is NSN 5985-01-040-4182

MIL-DTL-55041/10A

Custodians:
Air Force - 11
DLA - CC

Review activity:
Air Force - 99

Preparing activity:
DLA - CC

(Project 5985-1152)